

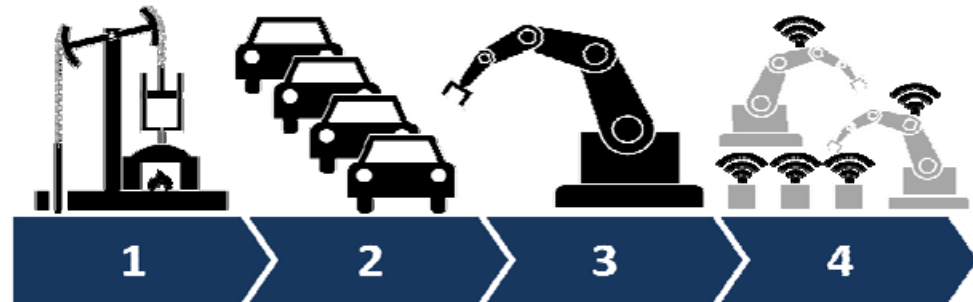
Industry 4.0 and i<sup>3</sup>S  
inclusive innovation industrial strategy  
Transforming the Philippine Economy  
in the New Digital Age

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Securing the Future of Philippine Industries

# 4<sup>th</sup> Industrial Revolution: impact on industries



Mechanization via water & steam power	Mass production via assembly line & electricity	Automation through electronics & information technology	Cyber-physical systems
18 <sup>th</sup> Century	Late 19 <sup>th</sup> Century	20 <sup>th</sup> Century	2010 Onwards



- spur development of new production techniques & business models that would transform global production systems
- drive new, more distributed & connected value chains
  - trigger selective reshoring, nearshoring & other structural changes in GVC
  - certain skills & capabilities will be required at each stage of the GVC
- add another layer of complexity to the challenging tasks of developing globally competitive industries
  - put at risk the viability of low cost manufacturing & services exports as source of growth & development

# Some Philippine industries in 3.0, many are still transitioning from Industry 2.0 to 3.0



**IT-BPM: strong in voice, to move up the value chain, non-voice high value knowledge process outsourcing**



**Automotive: completely-knocked-down (CKD) assembly & parts manufacturing like large plastic and metal body parts, strategic parts**



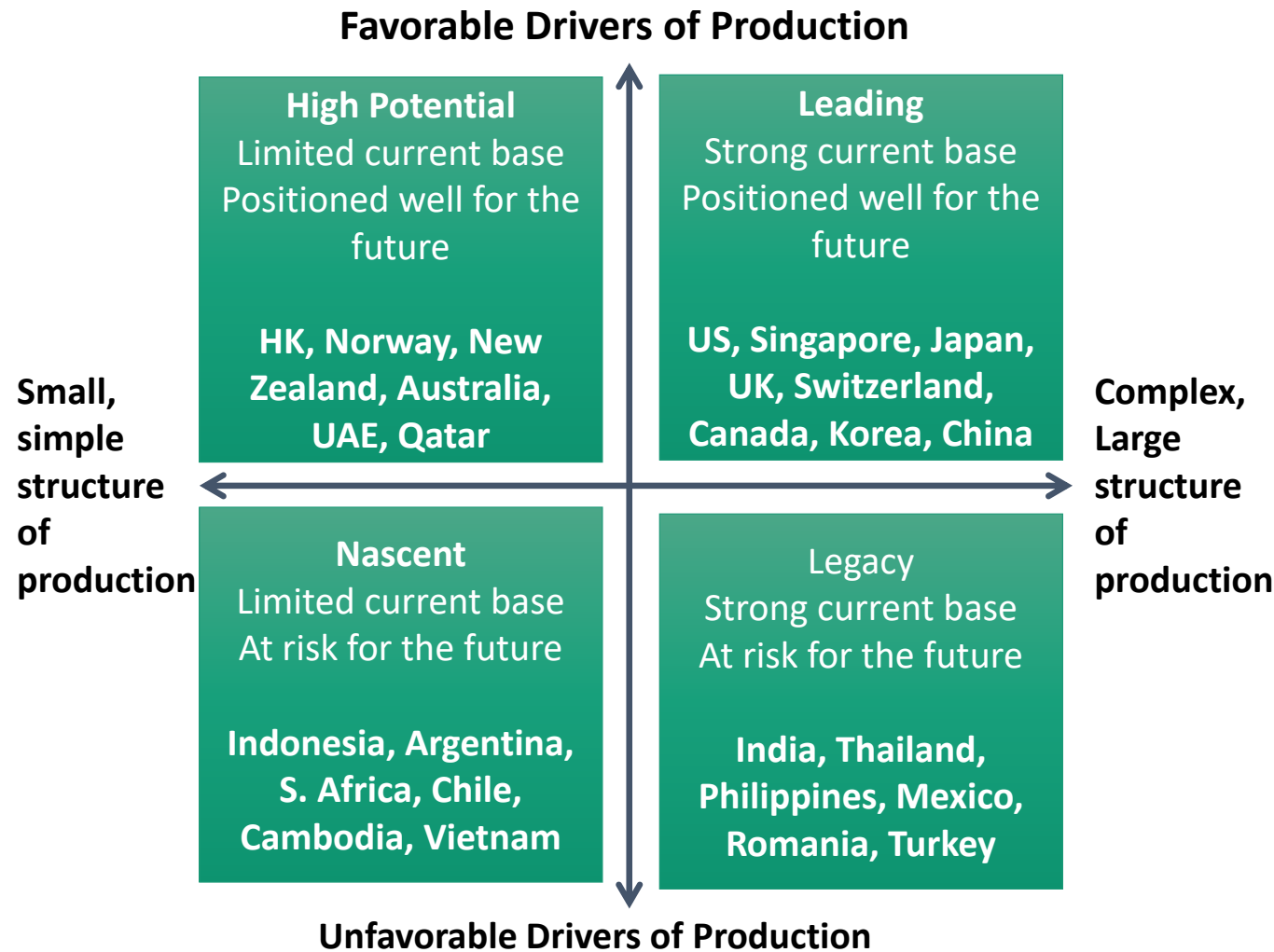
**Electronics: mainly semi conductor manufacturing services particularly in labor-intensive, back-end assembly process & test**



**Agriculture still in mechanization phase**



# Readiness for the Future of Production Assessment



- The World Economic Forum (2018) assessed the readiness of 100 countries for future production & harness full potential of Industry 4.0
- There are 4 country classifications (high potential, leading, nascent, & legacy) based on 59 indicators across drivers of production (vertical axis) & structure of production (horizontal)
- Legacy (where PH belongs): have a solid production base but countries need to reskill/upskill, upgrade technology platform, innovation, good governance

# New Industrial Strategy

## GLOBAL & DOMESTIC CONTEXT



### Overall Goal

- ◆ Build innovation & entrepreneurship ecosystem  
-> upgrade & develop new industries
- ◆ Remove obstacles to growth  
-> attract investments, create jobs
- ◆ Strengthen domestic supply chains & participation in global/regional value chains  
-> link manufacturing with agriculture & services



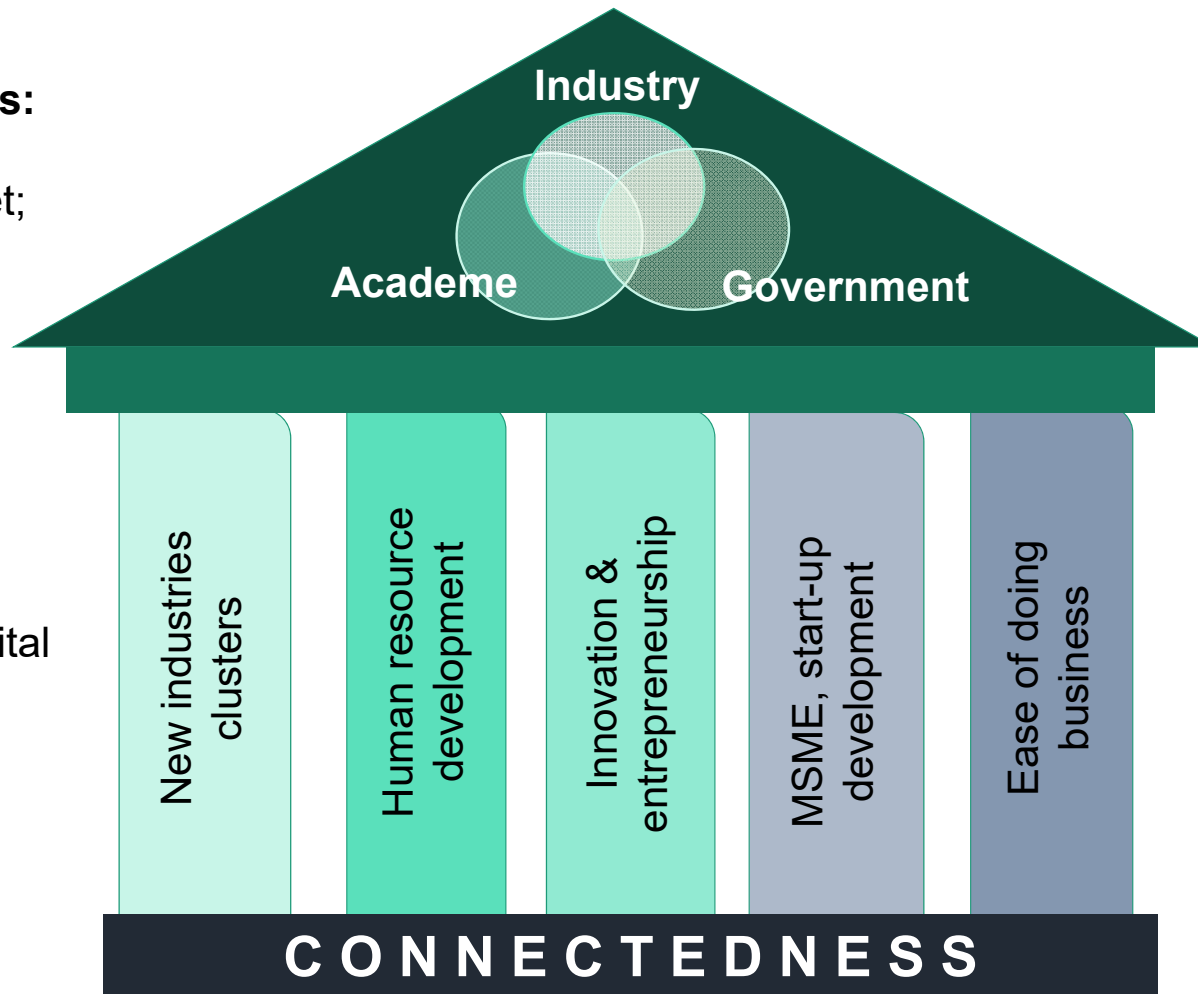
**Role of Government:** address coordination & market failures;  
create proper environment for private sector growth



**New Industries, clusters:**  
supply/value chain gaps;  
domestic & export market;  
trade & investment  
promotion; incentives

**Human Resource  
Development**  
upgrading education  
curricula, skills training  
programs, improving digital  
skills

**MSMEs:** access to  
finance, markets, skilled  
labor, technology  
7Ms: mindset, mastery,  
mentoring, money,  
machine, market,  
models



**Strong government-academe-industry collaboration**

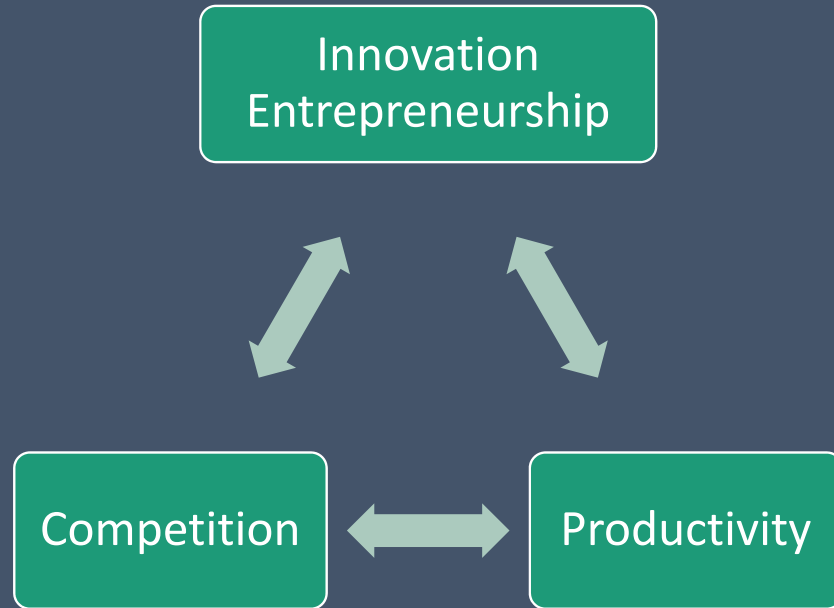
**Innovation & Entrepreneurship:**  
government-academe-industry  
linkage, market-oriented  
research; R&D centers,  
innovation incentives;  
shared facilities & support  
for startups, regional  
inclusive innovation hubs

**Ease of Doing Business:**  
simplification of  
processes, automation;  
power, logistics,  
infrastructure

## **i<sup>3</sup>S Five Major Pillars**



# Innovation is at the front & center of our new industrial policy



Underlying Framework of PH industrial strategy  
COMPETITION- INNOVATION-PRODUCTIVITY NEXUS



Global Innovation Index 2018

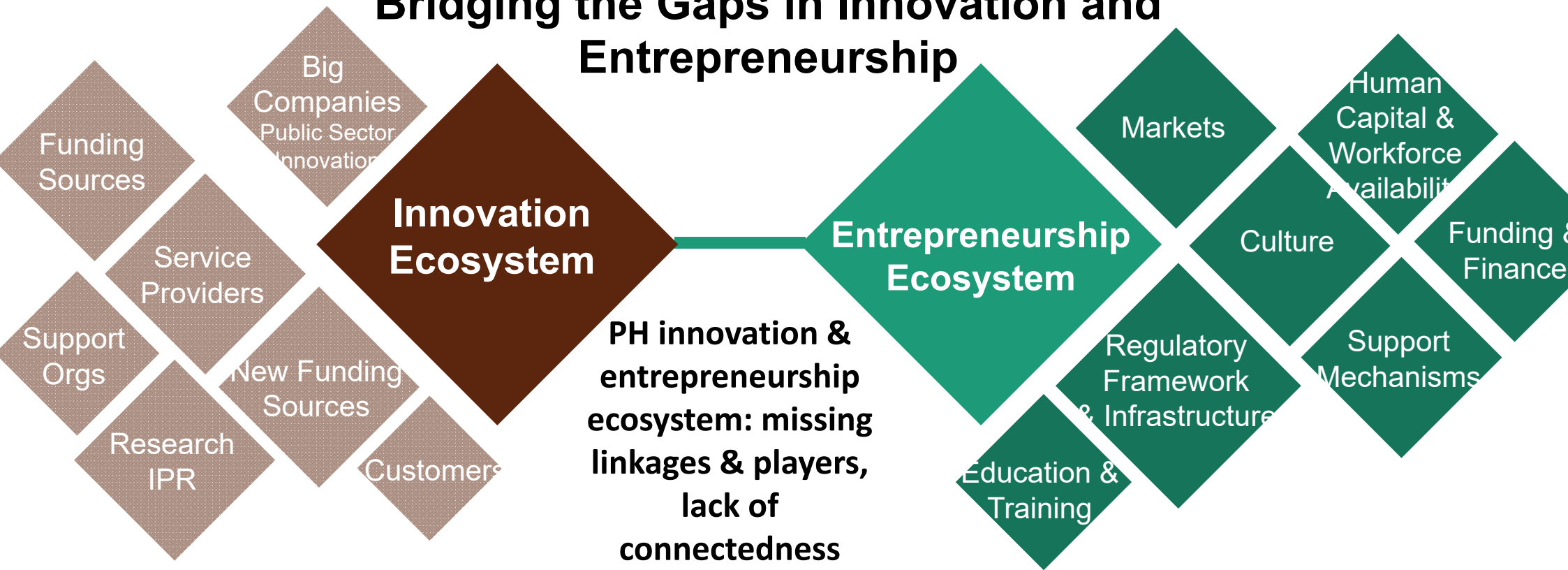
## ASEAN

5. Singapore
35. Malaysia
45. Viet Nam
44. Thailand
57. India
- 73. Philippines**
85. Indonesia

## PH scored lowest

- **Creative outputs:** intangible assets, creative goods & services
- **Human capital:** education, R&D spend
- **Market sophistication:** ease of getting credit, ease of protecting minority investors, venture capital deals
- **Innovation linkages, ICT infrastructure**

# Bridging the Gaps in Innovation and Entrepreneurship



- ◆ Strong collaboration among government, academe, industry → connected country
- ◆ Strong business & policy environment → sustainable growth
- ◆ Creative talent pool: critical mass

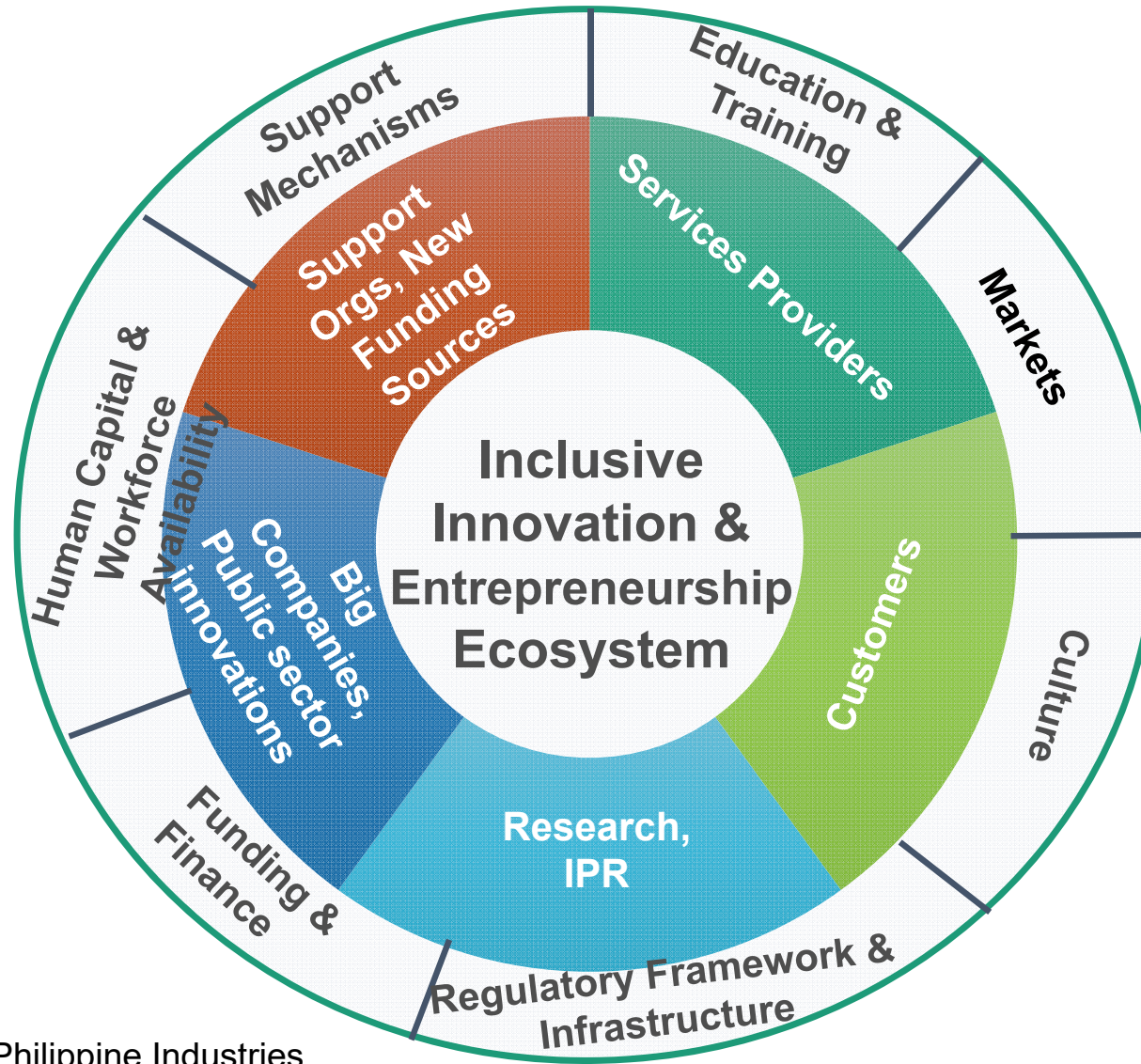
poverty reduction





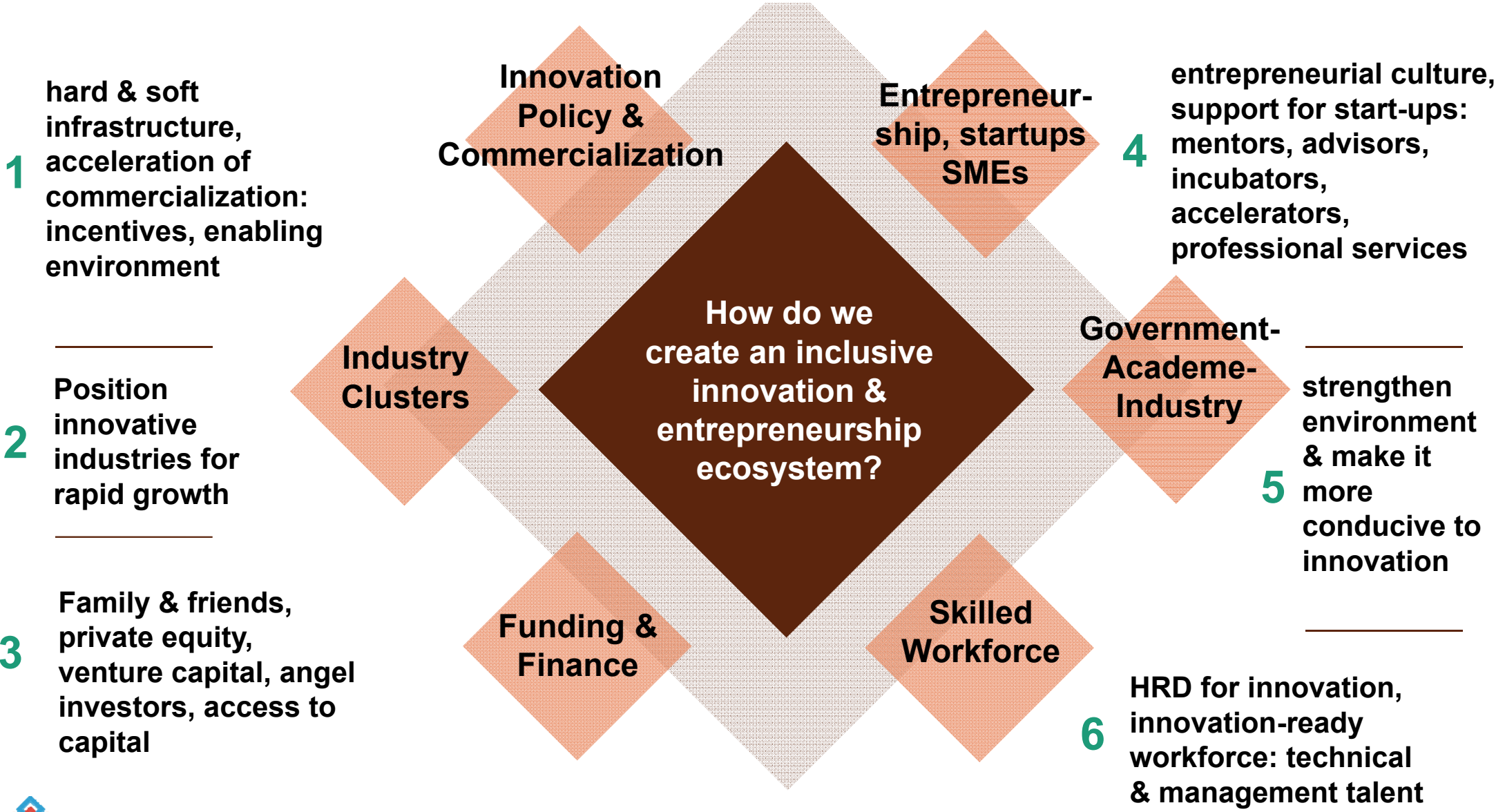
# Vision: Inclusive Innovation & Entrepreneurship Ecosystem

- Strong collaboration: connected country
- Strong business & policy environment: innovation, jobs, investment
- Creative talent pool

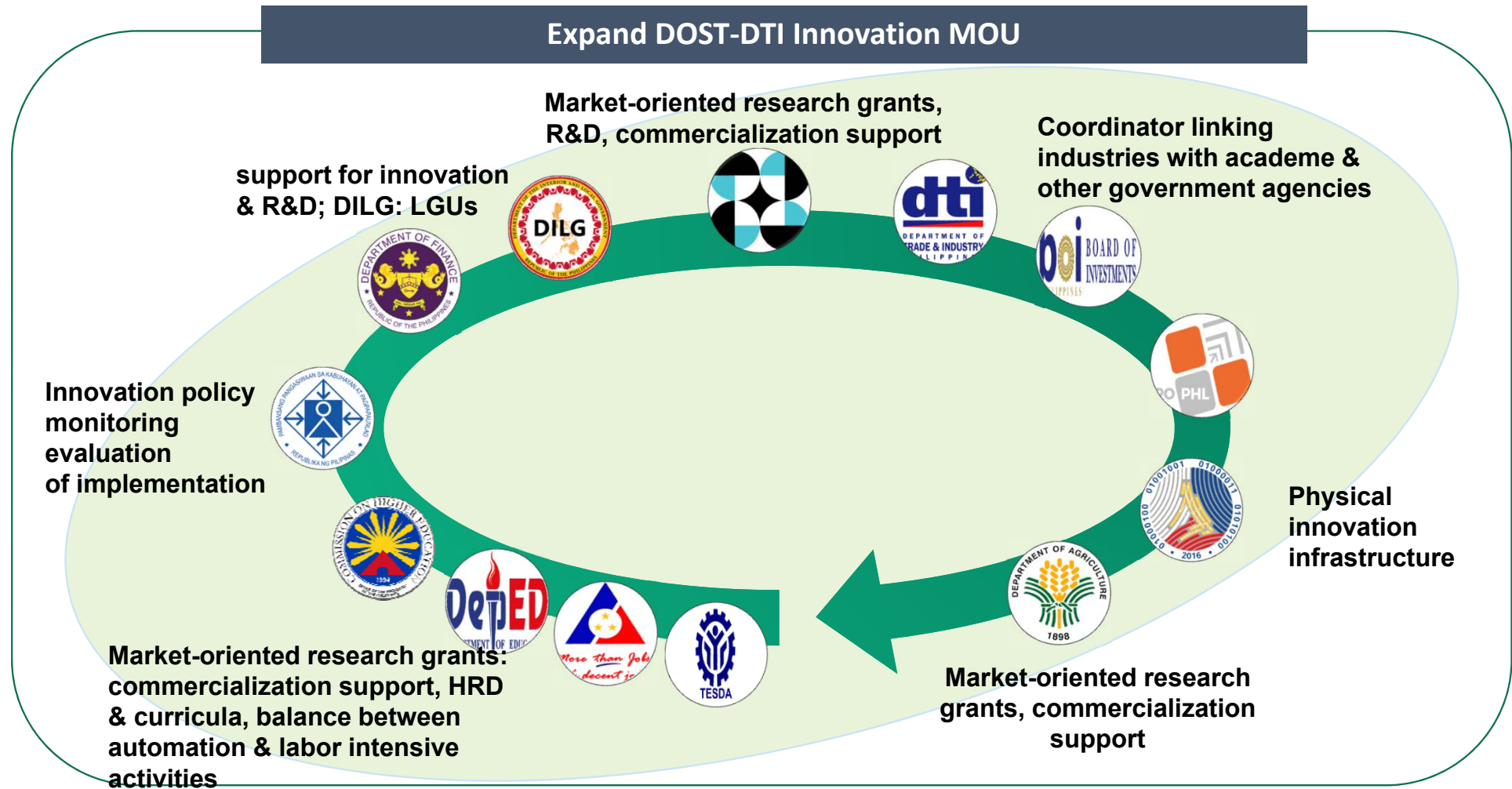


- Incubation of innovation
- Academic industry partnerships to conduct basic, applied, market oriented research
- Support by government & funders
- Involve researchers & experts & industries across the country



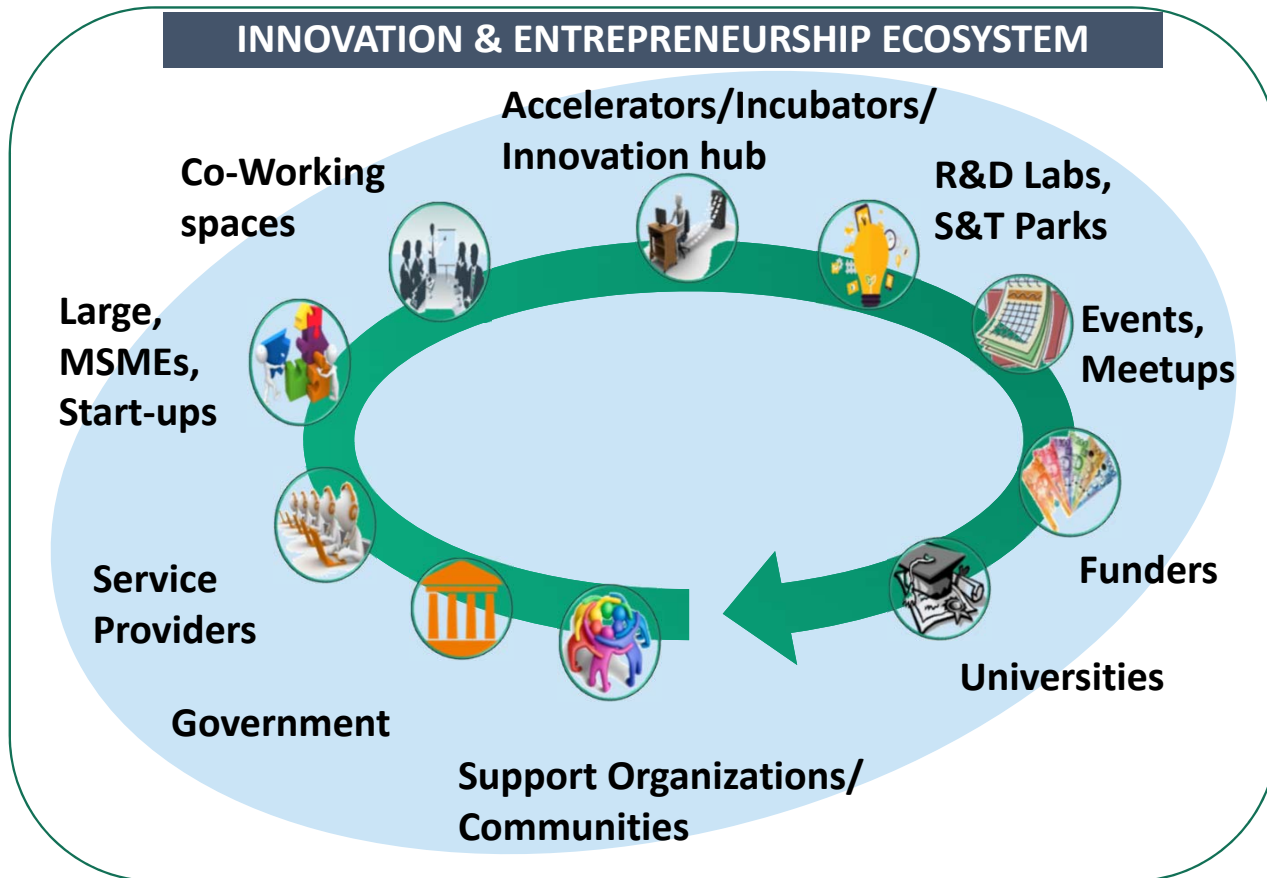


# To promote collaboration & closer coordination within government



# Innovation is at the front & center of industrial policies

## Regional Inclusive Innovation Hubs/Centers



- Regional & local inclusive innovation hubs: cornerstone of i3S, lie at the heart of our economic transformation
  - Bridge gap between industries & academe
  - Create regional ecosystem: **virtual & physical** made up of universities, R&D labs, S&T parks, incubators, fab labs, co-working spaces, investors, & LGUs, start-ups, SMEs, LEs
  - DOST & other agencies, industry, & academe
- Innovation focus on electronics, auto, aerospace, chemicals, IT-BPM, agribusiness



# Upgrading Trajectories for Priority Industries

R&D, IC design, facilities for advanced products & technologies, auto electronics, aerospace electronics, batteries, consumer electronics



**Electronics & electrical**

ESO, data analytics, legal process outsourcing, health information management (preventive health, remote), animation & game development, IT services, global-in-house, services embedded in manufacturing



**Automotive**

Auto electronics, ADAS components, engineering services outsourcing, electric motor powertrains like battery, EV



**Aerospace parts**

Flight control actuation systems, servo actuators, servo valves, galley inserts, structures & equipment, seat parts, lavatories, interior fit-out, panel assembly, electronics, airframes & sub-assemblies; MRO: base & line maintenance



**IT-BPM**



**Agribusiness**

mangoes, bananas, nuts, coffee, cacao, coconut, & other high value crops



# Upgrading Trajectories for Priority Industries

## Industry Upgrading Short to Medium-run

- Close supply/value chain gaps
  - Auto: metal casting, forging, machining
  - High value added parts: Auto electronics, ESO, R&D, sensors, ADAS
- Accumulation of labor-intensive industries
- Products with good balance of semi-automation & labor-intensive work
  - Assembly & mid-inspection require labor-intensive work



**Construction  
Transport,  
Logistics**

Mass housing, land, air,  
& water transport,  
airports & seaports



**Furniture,  
garments**

Manufacturing &  
design



**Shipbuilding**

RORO as well as small- &  
medium-sized vessels



**Iron & steel**

Integrated steel  
manufacturing



**Parts &  
Components**

intermediate parts & components  
supply especially by SMEs



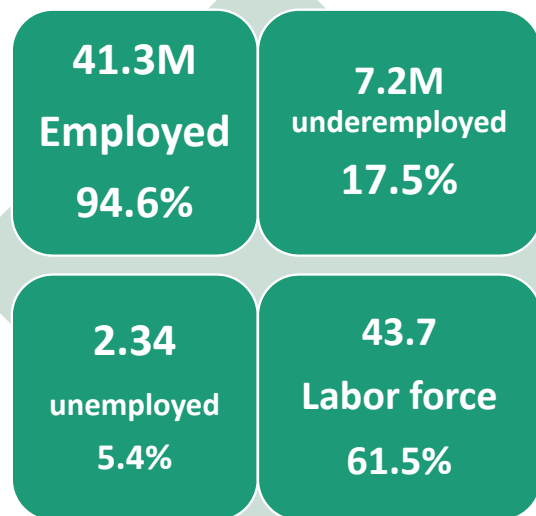
**Chemicals**

Petrochemicals, oleo chemicals, basic  
chemicals, plastics

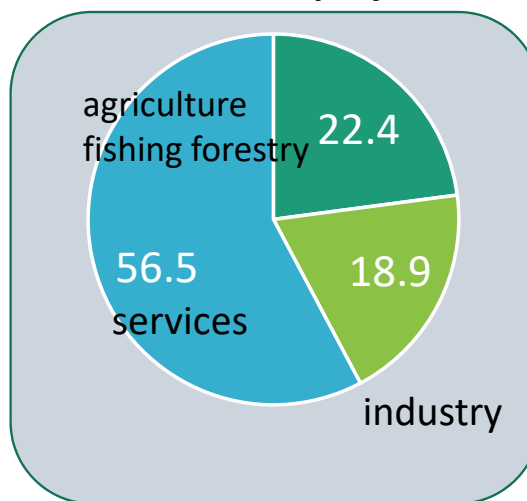


# Find the right balance between skills & technologies

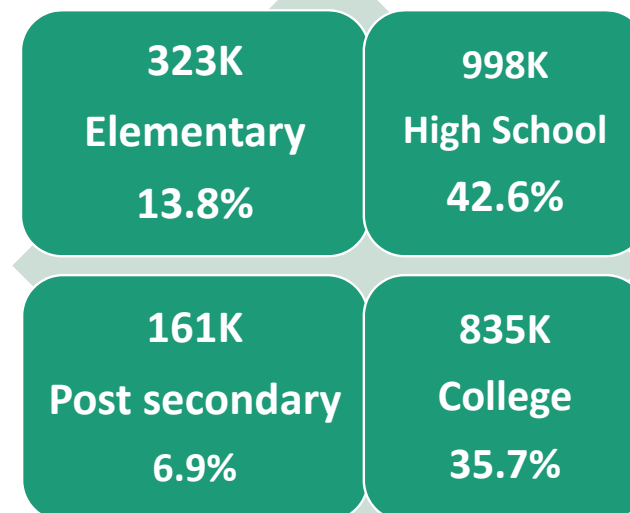
## Labor & Employment Profile



## Structure of Employment



## Characteristics of the Unemployed



**Skilled workers: 30M, 73% of total**  
**Unskilled: 11M, 27%**

**Skilled: Managers 16%, service & sales 15%, skilled agricultural 13%, craft & related traders 8%, plant & machine operators, assemblers 6%**

**STEM graduates declined from 235K (37%) in 2015 to 214K (30%) in 2017**

**Business Administration & Education & teacher training graduates increased from 296K (47%) to 341K (49%)**



# i3S is vital for sustainable & inclusive development innovation is at the heart of our economic transformation



## ○ **PH industrial policy is innovation-focused**

- Link Manufacturing with Agriculture & Services
- Productivity leads to inclusive & sustainable growth
- Innovation crucial to productivity



## ○ **Innovation & Entrepreneurship strategy**

- Creative, connected communities
- Government-academe-industry: basic & applied research providing solutions to societal issues & industry needs



## ○ **Regional inclusive innovation centers**

- Bridge gap between innovation & entrepreneurship
- No one size fits all approach: regional/local conditions
- Industry clusters, strong business environment: jobs, investments, poverty reduction





# i3S for sustainable & inclusive development

## Propel Jobs, Investments, Shared Prosperity for all

- Human capital is crucial for innovation & entrepreneurship
  - knowledge production, technology adoption, productivity growth

Educational system to produce the quality of human capital that can advance innovation & entrepreneurship

- basic, secondary, tertiary: values, skills & competencies

Government-Industry-Education collaboration: policies & training programs that are more responsive to the fast changing dynamics of industry & avoid mismatch between technology & skills

Low-skilled, low-educated & routinized jobs are the most vulnerable to the adverse effect of technological change

Provide safety nets through innovation & R&D with education and training

